

CLAIMS

1. A surface acoustic wave device comprising:

5 a surface acoustic wave element having a first surface on which an electrode is formed;

a mounting substrate having an electrode on a surface and disposed facing the first surface with a gap of a predetermined distance sandwiched therebetween;

10 a bump for coupling the electrode on the surface acoustic wave element and the electrode on the mounting substrate to each other; and

a sealing resin formed on the mounting substrate so as to cover the surface acoustic wave element;

wherein the sealing resin is a laminate including not less than three layers of resins each having a different elastic modulus.

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2. The surface acoustic wave device of claim 1,

wherein the sealing resin comprises

a first resin surrounding the surface acoustic wave element and covering the mounting substrate on a periphery of the surface acoustic wave element,

20 a second resin covering at least the first resin, and

a third resin covering at least the second resin,

in which the third resin has an elastic modulus that is lower than an elastic modulus of the second resin and that is higher than an elastic modulus of the first resin.

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3. The surface acoustic wave device of claim 2,

wherein a thickness of the first resin formed on a side surface of the

surface acoustic wave element is $1/10$ to $1/2$ of the distance of the gap.

4. The surface acoustic wave device of claim 2,
wherein at least the second resin in the sealing resin further intervenes
5 in a part of the gap between the surface acoustic wave element and the
mounting substrate.

5. The surface acoustic wave device of claim 4,
wherein the second resin is a resin filled with filler.

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6. The surface acoustic wave device of claim 5,
wherein the filler comprises filler having a diameter that is 40% or more
of the distance of the gap.

15 7. The surface acoustic wave device of claim 2,
wherein the second resin and the third resin are not brought into direct
contact with the mounting substrate.

8. The surface acoustic wave device of claim 2,
20 wherein the second resin is brought into contact with the mounting
substrate via the first resin and the third resin is brought into contact with the
mounting substrate via the first resin or the second resin.

9. A surface acoustic wave device comprising:
25 a surface acoustic wave element and a mounting substrate, which are
disposed in such a manner in which a surface of an excitation portion of the
surface acoustic wave element faces an upper surface of the mounting

substrate;

a pad electrode on the surface acoustic wave element and a pad electrode on the mounting substrate both being fixed with a bump so that they are electrically coupled to each other; and

5 an upper surface of the mounting substrate being sealed with sealing resin so as to cover the surface acoustic wave element in a state in which vibration space is secured between the excitation portion of the surface acoustic wave element and the mounting substrate;

wherein the sealing resin has at least three-layered structure including,
10 a first resin covering a rear surface and a side surface of the surface acoustic wave element and at least a part of the upper surface of the mounting substrate,

a second resin covering at least the first resin, and

a third resin covering at least the second resin,

15 in which the second resin has an elastic modulus that is higher than an elastic modulus of the third resin and the first resin has an elastic modulus that is lower than an elastic modulus of the third resin.

10. The surface acoustic wave device of claim 9, wherein at least the second
20 resin exists in a part of space between the surface acoustic wave element and the mounting substrate.

11. The surface acoustic wave device of claim 1, wherein the elastic modulus of the third resin is not lower than 5 GPa and not higher than 10 GPa.